Multidisciplinary Journal of Management, Economics, and Accounting
ISSN: 2705-2842
Number 7 Issue 2 2021

Difficulties Experienced By Higher Education Teachers During The COVID-19 Pandemic

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Abstract

The COVID-19 pandemic changed the schedule of activities proposed for the academic year 2020-21, in which face-to-face classes were replaced by emergency remote teaching (ERE). For higher education professors, although good teaching practices are a constant concern of universities, challenges have arisen due to the sudden transition and implementation of the ERE. For this reason, this study aimed to investigate the main difficulties encountered by higher education professors in Brazil, dealing with the ERE during the COVID-19 pandemic. Data collection took place between December 2020 and February 2021, using an electronic questionnaire consisting of 19 objective questions. 234 teachers participated in the study, of which 77.4% of the participants had difficulties during the adaptation process for the ERE, and are related to the lack of training or technological resources given by the institutions; problems with the use of digital technologies (tools and software); influence of psychological difficulties; difficulties associated with administrative bureaucracy or with Data Security. It is clarified that the transition must be carried out with planning and investment in the adequate training of teachers, so that education in a virtual context achieves the same success as face-to-face meetings.

Keywords: pedagogical difficulties; emergency remote learning ; pandemics ; COVID-19 ; pedagogical methodologies; digital technologies.

1. Introduction

Between the end of 2019 and the beginning of 2020, a new virus called "SARS-CoV-2" was identified as responsible for causing COVID-19 (Zhou et al., 2020). It was initially found in China and subsequently spread around the world, and in March 2020, the World Health Organization (WHO) declared that it was a pandemic. Numerous protocols will be adopted to prevent the spread of viruses (WHO, 2020a). Among them, the social isolation, which generated significant impacts in the educational area (Brasil, 2020; Jelińska & Paradowski, 2021).

At this time, the Ministry of Education of Brazil by means of the portal MEC nº 345, of March 19, 2020, provides for the replacement of face-to-face classrooms, on an exceptional basis, for the use of information and communication methods and technologies, or seja , by Emergency Remote Ensino (ERE), while the COVID-19 pandemic remains (Brazil, 2020). The higher education institutions (IES) suspend their in-person activities, which substantially affect students and teachers (Brasil, 2020; Jelińska & Paradowski, 2021). Some priorities have been established by the government, in order to guarantee the continuity of education in Brazil, including access to teaching materials for students (books and digital apostilas), virtual validation processes and preparation of the professionals involved (teachers and other officials of the institutions of education), on the use of digital technologies and communication tools (Daniel, 2020). Embora as good teaching practices seem to be a constant concern of universities, not all institutions are prepared to provide the support and training necessary for non-ERE teachers (Polydoro, 2020; Jelińska & Paradowski, 2021).

The quality and educational effectiveness of ERE can be influenced by exclusively online classrooms, preventing face-to-face contact, which is perceived by both students and teachers (Jelińska & Paradowski, 2021). However, it is expected that by obtaining, understanding and mastering two different types of educational approaches, technological and teaching instruments, or ERE can sufficiently meet the needs in this context (Daniel, 2020; Garbin & Oliveira, 2021).

The use of technologies associated with appropriate teaching methodologies can innovate and make learning processes more flexible, essential for digital literacy (Suguimoto et al., 2017; Carneiro et al., 2019). This set of knowledge and skills allows the use of electronic devices and commands via software, enabling the immersion of students and teachers not to teach e-learning (electronic teaching supported by digital technologies) (Suguimoto et al., 2017; Silus et al., 2020). It is emphasized that, before working with the use of software and digital technologies, it is necessary to instruct about their functionalities and the consequences of their use in social relations, as well as their contributions to teaching and learning (Moore et al. ., 2021).

Due to the sudden mode of transition and implementation of ERE, which evidences the lack of training and knowledge necessary for this practice, some difficulties have been reported by both teachers and students of the institutions (Jelińska & Paradowski, 2021). Some factors that can influence the quality of teaching and learning have been identified: psychological questions, anxiety and frustration in the face of so many uncertainties (Chaturvedi et al., 2021) and harmonious relationships between students and teachers (Brooks et al., 2020); difficulties in the use of digital communication technologies (TDIC's) (Silus et al., 2020; Dwivedi et al., 2020), digital exclusion (common in developing countries) and

inadequate technological resources (Arruda, 2020; Roggero, 2020) ; privacy and security of users (Jelińska & Paradowski, 2021).

1.1 Teaching activity and use of technologies

The training of teachers who work in basic education in Brazil is carried out in the higher degree courses offered by IES. To perform higher education, a teacher's or teacher's degree is sufficient, depending on the requirements of the institution, in accordance with the Brazilian Educational Law 9.394, of December 20, 1996 (Arroio et al., 2006), which defines the training of teachers. Only the courses are the type of degree received during your post-graduation.

In this context there is another gap that needs to be explored and that is evident during the Covid-19 pandemic: the use of technologies. The debate on the importance of teacher training for the intentional use of technologies is new in Brazil, but has become more intense in recent years (Garbin & Oliveira, 2021). In December 2019, we established the National Curricular Directorates for Professors of Basic Education (Brazil, 2019). We define the general competencies necessary for teachers in training and make references to technologies in just three of them. Just like students, teachers need basic digital skills to make an effective contribution to the education of their students (Sailer et al., 2021).

Such discussion is important, especially in the scenario lived during the years of 2020 and 2021, because the topic is neglected in teacher training in the Brazilian context. What is evident in this process is that teachers of higher and basic education combine their teaching knowledge and do not use technologies in different contexts, so that education, in some way, does not stop (Garbin & Oliveira, 2021).

Maphalala and Adigun (2021) indicate that for the adoption of the remote education model, several topics must be passed: "planning; technical support and training for e-learning; Information and Communication Technology Infrastructure and Internet Accessibility; e-learning oil and use of the Learning Management System; content development for e-learning; "and validation of teaching effectiveness through e-learning." For além disso, according to Moore et al. (2021) and Jelińska and Paradowski (2021), the transition to ERE depends on factors that include communication, technology and pedagogy, thus, it is necessary to go between two technological devices, but relate these elements.

In addition to these questões, given the social isolation, teachers will have to worry about the safety and well-being of students and their families, this being considered a stressful factor in the situation during the ERE (Besser et al., 2020; Gelles et al., 2020). As has been noted in current literature, during professional exercise and academic life, teachers and students can face anxious and stressful moments that contribute to mental and physical complications (Costa & Nebel, 2018; Assunção-Luiz et al., 2021). These factors may have been intensified during the pandemic, being related to restrictive measures and other protocols imposed for coronavirus containment (Assunção-Luiz et al., 2021).

In this sense, this study aims to investigate the main difficulties encountered by teachers in public and private Brazilian institutions, faced with the emergency remote education modality during the COVID-19 pandemic.

2. **Methodology**

2.1 Casuistics and study outline

To achieve the objective proposed by this study, a quantitative approach with descriptive and transversal design was used. The sample was made up of teachers,

of both sexes and without age limitations, from public and private universities, from different regions of Brazil, during the years 2020 and 2021, who experienced the context of the COVID-19 pandemic. Excluded are those who do not respond to the questionnaire within the data collection period stipulated by the authors.

This study respects the ethical principles advocated by Resolution 510/16 of the National Health Council (Brazil, 2016). Before responding to the dice collection instrument, participants gain knowledge about two objectives, risks and benefits of the study, being assured of the confidentiality of their dice at all stages. We will subsequently grant your consent for the dissemination of research results in scientific events and articles.

2.2 Dice queue instrument

To reach a larger number of teachers, the instrument used in this study was an electronic questionnaire prepared based on reference literature (WHO, 2020b) and in the lives and experiences of two authors, being a multiprofessional group with members of the educational and educational area. health.

The aforementioned questionnaire was previously tested by half of an online pilot study, from October to November 2020. Participating in this pilot study were 50 higher education teachers, linked to the same teaching institutions of the two authors, who provided feedback on the initially proposed questionnaire. It is emphasized that these participants were excluded from the final sample of the study. Among the modifications made, a quest was excluded and a discourse was adapted for objective purposes. Also here are suggested forums including items related to the software used by teachers: Google Jamboards, Games (example: Kahoot, Socrative, Mentimeter etc) and virtual libraries (example: Pearson, Minha Biblioteca etc). The redaction of two statements was maintained.

The final version of the questionnaire was inserted into the Google Forms platform, which makes it possible for this research to be answered by various professors, in different Brazilian institutions. Furthermore, the data collection carried out by electronic means makes it possible for participants to access it at the time and time of their greatest convenience. The questionnaire had a self-explanatory character, making it possible to provide guidance regarding its use, which must be verified by the participants during the pre-enchimento of data, without the need for a previous registry or application installed for their access.

This makes it possible to investigate central factors related to the objective of this research, such as: difficulties encountered in the previous experience of teachers in the EaD modality; main technologies used; eo use of software. It was composed of 19 multi-purpose questions, divided into two parts. Compose the first part of the new questões referring to the characterization of the sample (ity; sex; origin; area of training; level of qualification; duration of non-higher teaching; number of institutions in which it exists; characterization of the IES; area of atuação, second to classificação da Coordenação de Aperfeiçoamento Pessoal de Nivel Superior - CAPES) the second part was composed of 10 questões in respect of the transition period of two teachers for the ERE, being divided into four categories namely: (1) Technological resources and training offered by the institutions ; (2) Difficulties in the use of digital technologies: Tools and software used during remote teaching; (3) Psychological difficulties and the attitude of non-ERE teachers; (4) Bureaucratic aspects, pedagogical evaluations and data security.

The series of events occurred between December 2020 and February 2021. Participants are invited via email and/or communication applications such as

WhatsApp, Facebook, etc. The invitation included a brief presentation of the research and a link to access the form.

2.3 Dice analysis

The collected data are coded, categorized and edited to be analyzed using simple descriptive statistics and identification of possible significant differences between defined groups.

The simple descriptive statistics were obtained directly by the Google Forms tool, which provides a report of all the measured results, and allows us to characterize the samples and the variables studied. To identify possible significant differences between defined groups, the data are analyzed in a statistical environment R (4.0.1) and the Fisher's exact test is used in a pair-by-pair comparison. Probability values $\alpha < 0.05$ are considered statistically significant, along with the Odds Ratio (OR) values.

Thus, the possible associations between the difficulties faced by teachers are: (1) the resources provided by teaching institutions; (2) the bureaucratic aspects (problems with management, coordination or officials); (3) student endorsement; (4) previous experiences do not mean more than distance (EaD); (5) as questions referring to mental health; (6) the software used is not ERE; (7) interactivity with students.

3. **Results and discussion**

Taking into account the period of social distancing, the research carried out via Google Forms made it possible to find a sufficient sample number (n=234), as described by Silus et al. (2020), which suggests a minimum number of 200 participants in human research. The characterization of the participants is presented in table 1.

Table 1. Characterization of the agreement with: age, sex, type of institution in which it works, time of study, number of institutions, highest level of qualification, origin, and areas of study

Idad	Average:46.45 Fashion: 51 Median: 46.5
Sex	N (%)
Feminine	111 (47.4)
Male	122 (52.1)
I prefer not to inform	1 (0.4)
Setor da instituição em que atua	N (%)
Public – Federal	39 (16.7)
Public – State	158 (67.5)
Public - Municipal	5 (2.1)
Private	61 (26.1)
Years of tuning	N (%)
I was 5 years old	44 (18.8)
from 6 to 10 years	44 (18.8)
from 11 to 15 years	30 (12.8)
from 16 to 20 years	39 (16.7)
more than 20 years	77 (32.9)

Quantidade de instituições que atua	N (%)
1 institution	187 (79.9)
2 institutions	39 (16.7)
3 institutions	7 (3.0)
4 or more institutions	1 (0.4)
Higher level of qualification	N (%)
Degree	1 (0.4)
Bacharelado	2 (0.9)
Specialization	3 (1.3)
Master	38 (16.2)
Mastered	90 (38.5)
Post-doctorate	58 (24.8)
Livre Docência	42 (17.9)
Status in Brazil (%)	N (%)
São Paulo (SP)	189 (80.8)
Pernambuco (PE)	23 (9.8)
Rio de Janeiro (RJ)	3 (1,3)
Minas Gerais (MG)	15 (6.4)
Paraná (PR)	1 (0.4)
Paraíba (PB)	1 (0.4)

Mato Grosso do Sul (MS)	1 (0.4)
Maranhão (MA)	1 (0.4)
Areas of study	N (%)
Applied social sciences	77 (32.9)
Human Sciences	72 (30.8)
Engineers	49 (20.9)
Exact Sciences and Earth	47 (20.1)
Health Sciences	29 (12.4)
Multidisciplinary	27 (11.5)
Biological Sciences	20 (8.5)
Linguistics, letters and arts	17 (7.3)
Agricultural Sciences	15 (6.4)

Font: Prepared by the authors

In relation to the context of the COVID-19 pandemic, 94% of teachers have had their activities transferred entirely to remote teaching and the other 6% will follow the hybrid teaching model. This data is similar to that of other countries that transfer the data in its entirety for remote mode, as in the case of Morocco and Paraguai, and totally in contrast to the data of Nicaragua, a Caribbean country that has not been altered in any way in the mode of ensino (UNESCO, 2021).

An expressive number of 181 (77.4%) teachers presented difficulties not taught in a general way. In specific terms, these are summarized in: lack of training or technological resources on the part of the institutions; problems such as the use of

digital technologies (tools and software); influence of psychological difficulties; difficulties associated with administrative bureaucracy or data security. This result is in accordance with similar studies in the literature, which show that the transition from in-person to remote entails various difficulties (Paludo, 2020). As in the case of Borba et al. (2020) who studied problems during this transition in a sample of 187 teachers of fundamental and pre-vestibular education; and only one professor (0.5%) reported the total absence of any difficulties during this transition.

3.1 Technological and training resources offered by institutions

The lack of technological resources was pointed out as one of two reasons that led to the difficulty of the ERE. Two 181 teachers who affirm that they present difficulties, 66.3% mention some difficulties, being that 23.8% have insufficient technological provision and 18.7% do not receive any resources from the institution. Two respondents reported many difficulties, corresponding to 26% showing, 38.5% of these had insufficient technological provision and 15.4% did not receive any resources. Only 23% of the teachers did not present any difficulty in the ERE, and of these, 83% had sufficient preparation (course, training and orientation). Other factors also mentioned include problems with the operation of equipment (example: computers, notebooks) reported by 34.6% of teachers, lack of internet connection (58.1%), difficulties in using digital technologies (31. 6%) and the bureaucratic aspects of the institution (20.5%).

The provision of both technological equipment and specific training was tested as well as associations with non-ERE difficulties. More specifically, the level of difficulties of those professors who receive the teaching institution's equipment, lectures, courses, and technological resources was explored. We identified

difficulties that are minor three times not in teaching, but when teachers receive equipment or electronic devices (p = 0.0372; OR = 3.349), and when they have access to courses and training for the ERE (p = 0.0094; OR = 3.176).

The above data demonstrate the importance of preparation for the ERE training as well as the provision of technological resources. The difficulty of teaching at a distance associated with the lack of training or the lack of technological equipment is of utmost importance, mainly because the success of the transition not in remote learning depends on factors that include communication, technology, pedagogy and community (Moore et al. , 2021; Jelińska & Paradowski, 2021). Results that confirm these factors already demonstrated in the literature, such as Moore et al. (2021), which evaluated the experiences of students during a face-to-face transition-ERE on a medical campus at the Universidade do Arkansas (University of Arkansas), and identified that 64.5% of the students interviewed had a satisfactory transition associated with the provision of technology and training two teachers.

3.2 Difficulties in the use of digital technologies: tools and software used during remote teaching

In moments of interaction between teachers and students, different TDIC's formats are used, such as the tools of Microsoft (Skype, Teams, OneDrive and Office), Google (Meet, Drive, Classroom, Forms, Jamboards, Docs and Youtube), Facebook (Messenger, Facebook, Whatsapp, Instagram), Moodle platform, AVA, Prezi, Zoom, games (Kahoot, Socrative, Mentimeter), virtual libraries, Telegram and Twitter (Figure 1).

Among the methodologies and tools used for the online classrooms, 218 teachers (93%) made use of synchronous activities that allow “live” interaction between

teachers and students through audioconference, videoconference or web-based communication, and 210 teachers (90%) opt to use Google Meet for these synchronous moments. The tools used in synchronous modalities are intended as ideas and presentations for students, which reinforce the significant potential and promise of the future of education (Khalil et al., 2020). In relation to asynchronous communication with students, WhatsApp was used by 148 teachers (63%). Communication between students and teachers, whether synchronous or asynchronous, is an essential part of the learning success of non-remote students, mainly during the abrupt transition experienced during this period (Moore et al., 2021).

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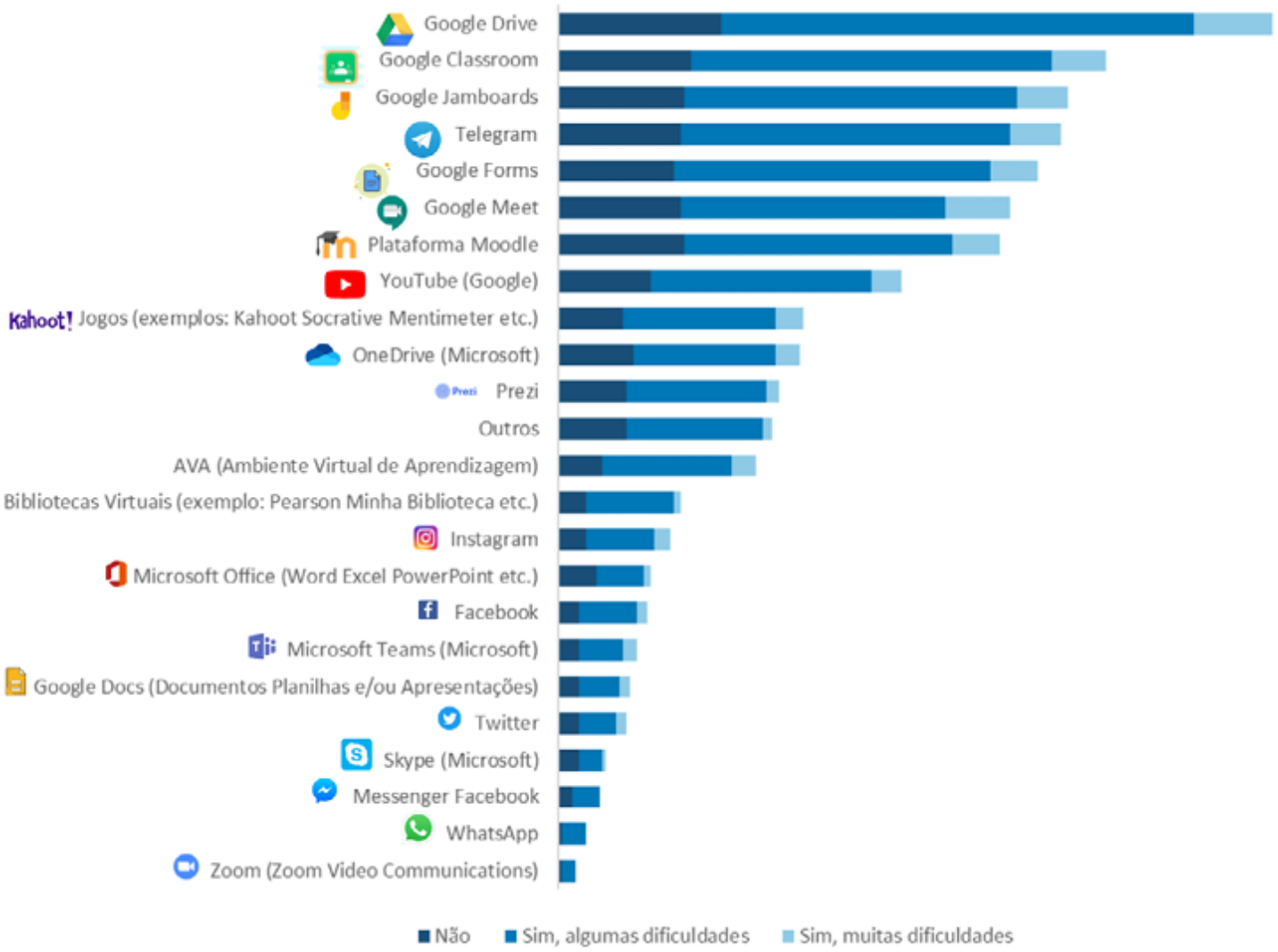
of Management, Economics, and Accounting
ISSN: 2705-2842
Number 7 Issue 2 2021



Graph 1. Frequency of use and levels of difficulty according to each software/application during the ERE.

Fonte: Prepared by the authors.

Although in the pandemic, these tools were frequently used among teachers, and received wide dissemination, 130 (55%) teachers reported difficulties in their interactions with students. Only 12% of teachers report having a lot of interaction with their students during remote teaching. Even before the pandemic, Santaella

(2013), to address the use of technologies for pedagogical processes, demonstrates that these resources, embora tenham or intuition of breaking barriers, traces an unexpected communication difficulty, reported by 65.3% two teachers participants of your study. This interaction can lead to a communication gap between students and teachers, and create opportunities that impact the quality of online learning (Bacich et al., 2015; Khalil et al., 2020).

On the other hand, Santaella (2013) suggests that the interaction between teachers and students can be expanded to better explore the resources available for tools, thus becoming an advantage for remote learning. This point was evidenced in this study regarding the use of Google Jamboards, which is an interactive area. It stands out compared to other software validated in this research, because it allows interaction with students in comparison with other tools ($p = 0.0189$; $OR = 2.181$). In addition, it is highlighted that teachers who use Microsoft Office package programs tend to have 2.6 times less difficulties in remote teaching ($p = 0.0260$; $OR = 2.687$), and that twice as much difficulty in using Moodle platform ($p = 0.0189$; $OR = 2.181$).

To analyze the fact of having no previous experiences or contacts with the tools used are not ERE and how these reflect on the difficulties faced by the professors, foram statistically significant differences have been identified. We will compare teachers with different levels of difficulty: those who have no difficulty at all, those who have little difficulty, and those who have very little difficulty. A more significant comparison is that the group of those who “have no difficulties” and those who have “very difficulties”, teachers who have previous experiences with these tools tend to present four times fewer difficulties in remote activities ($p = 1.00.10\text{-}6$; $OR = 14.091$).

Before the pandemic, distance learning was an option for educators to use different learning strategies, however with the pandemic this modality was the only way to continue education (Ismaili, 2021). Such an approach requires great effort on the part of the teaching staff, mainly in relation to the need to raise the levels of competencies and proficiencies in the use of different technologies (Marek et al., 2021; Al-Balas et al., 2020). On the other hand, teachers who have no experience in EaD or have already mastered the use of tools and software used in teaching, have less difficulty in ERE, given that these technologies are already integrated into their everyday teaching methodologies (Marek et al., 2021).

Another investigation that correlates to previous experience of two educators who do not teach at a distance with the perception of confrontation between students, demonstrates that these teachers estimate that their students have fewer difficulties in comparison with professors who do not have previous experience with conducting online courses (Jelińska & Paradowski, 2021). Thus, the results found here demonstrate that previous EaD experiences make the transition to remote emergency training more positive, when compared to the absence of experience (Marek et al., 2021).

Therefore, one possibility to better deal with similar situations in the future would be to incorporate the learning experience through remote technology and online activities into the regular educational agenda. Thus, teachers and students can develop important digital skills, digital literacy, and prepare to deal better in another possible emergency event (Shamir-Inbal & Blau, 2021).

Another topic investigated by this study involves the difficulty of two teachers in relation to their experience in relation to the time of their work as a teacher. It was identified that teachers with longer periods of teaching tend to have three times

more difficulties than ERE, this being evidenced by the comparison of teachers with less than 5 years of teaching with those who are between 16 and 20 years old, not teaching ($p = 0.0395$; $OR = 3.122$). Such a decline may be related to the low age of these teachers, where they have less professional training time for newer individuals and may have better mastery of digital technologies ($p = 0.0004998$). This 'technophobic' phenomenon, based on new information and communication technologies, associated with reality, was described in the literature even before the pandemic (Machado et al., 2019; Santos, 2020). Higher education professionals tend to be more culturally resistant to changes, due to a lack of preparation with these digital resources. These professionals can internalize situations of inferiority perante with their newer teaching colleagues and students who are immersed in technology and the digital universe since their birth (Machado et al., 2019; Santos, 2020).

3.3 Psychological difficulties and adjustment of non-ERE teachers

When associating psychological difficulties with teaching difficulties, 42.7% of the participants reported involvement in mental health and, among these, 18% presented many difficulties, while 73% demonstrated some difficulties. In the analysis of how external psychological problems can reflect teaching difficulties, it was identified that teachers with some type of psychological problem tend to present five times more difficulties than ERE ($p = 1.40.10\text{-}6$, $OR = 4.912$).

A plot shows that 36% did not have prior experience with activities in teaching and virtual learning environments. These psychological aspects may be related to difficulties in use and handling, together with a lack of instruction and preparation for the implementation of ERE (Araújo et al., 2020). There is little interaction between teachers and psychological difficulties with students, with only 9% having

much interaction. Além disso, different failures and technical problems have been pointed out as a challenge that can generate non-teaching psychological difficulties (Khalil et al., 2020).

The pandemic impacted the short- and long-term mental health of many people around the world, mainly as post-traumatic stress disorder (Maqsood et al., 2021; Usher et al., 2021). The extreme quarantine and lockdown measures increase the feeling of solidarity among people. These factors can impact the reduction of teaching and learning effectiveness (Usher et al., 2021). The educational challenges encountered by teachers are only more difficult to handle in remote emergency situations than in "normal" conditions, as teachers are required to prepare for lidar also with students who present patterns of stresses and anxieties in adaptation to ERE (Gelles et al., 2020; Usher et al., 2021).

Furthermore, the new challenges in relation to the use of teaching technologies and methodologies by two teachers also contribute even more to the overload of remote work (home office) in ERE. This rate of excessive work to maintain academic productivity is also responsible for increasing two levels of stress and causing symptoms of anxiety, depression and anguish, given the uncertain paths of the pandemic, seeking to acquire knowledge and intensify the flow of information. (Araújo et al., 2020).

It is worrying that teachers also present psychological difficulties without requiring attention during remote emergency training, therefore there should be an offer of mental health care to these professionals by the institutions. These problems can cause blockages and serious implications impacting performance during the teaching process. Thus, the aspects of this work corroborate with data already presented in the literature, where the challenges in mental health including

frustration, stress and depression are not limited to students (Chaturvedi et al., 2021; Assunção-Luiz et al., 2021).

3.4 Bureaucratic aspects, pedagogical evaluations and data security

Among the teachers who report that they have "very difficulties" (11%), during the transition to remote teaching in the context of the pandemic; 73% point to difficulties in relation to bureaucratic aspects of the institution necessary in non-ERE pedagogical practice. Além disso, 69.2% have difficulties related to student evaluations. Of all the regression models developed, two significant associations with identity have been identified. It is confirmed that people with more advanced education tend to have fewer difficulties in assessing students ($p = 0.0090$, $OR = 0.7098$), as well as fewer data security problems ($p = 0.0005$, $OR = 0.6053$).

These results show the possibility that as professionals advance in life, they accumulate teaching experiences and learning time. In this way, even in a situation of teaching at an emergency distance, points of life as endorsement of two students were not prejudiced. In relation to fewer problems with data security, these results may be a reflection of a more conservative stance presented by older people in virtual environments.

Valiação is essential for students to follow their learning results. There are various online platforms that offer different endorsement methodologies, however, all of them have advantages and limitations. An important point is that institutions must minimize bureaucratic setbacks and encourage quests related to the educational environment in the face of a pandemic (Maqsood et al., 2021). Likewise, it is important to note that the online learning model and the learning results must be regularly evaluated to monitor its effectiveness (Khalil et al., 2020). On the other hand, it is relevant to reinforce that the rapid expansion of COVID-19 does not

allow governments and institutions to take adequate time for adequate preparation in the ERE regime (Daniel, 2020).

Other difficulties are presented as, for example, the report of 46.2% of two teachers in the elaboration and realization of practical activities. These aspects are related to the literature, where it is highlighted that teachers and educational managers need to readapt to the ERE context in order to maintain the quality of teaching and learning (Lima et al., 2020). However, these changes can cause tension in pedagogical processes, causing, therefore, some difficulties that can be eliminated from new perspectives for teacher training in education mediated by technologies (Garbin & Oliveira, 2021).

3.5 Lacuna and limitations of the study

This research was carried out virtually through the use of communication tools and applications. When using these types of approaches, studies are exposed to some limitations, which may interfere and/or hinder the research process. We can mention personal difficulties that each person fears using some types of technologies, or that consequently can make difficult the preparation of the dice collection instrument used in this study. Furthermore, it should be considered that in some places the use of the Internet is more scarce, or that it may also be delimited to the characterization of the sample group presented.

At the time when it was done by chance, at the end of 2020, the country went through a complicated moment due to the large increase in the number of Covid-19 cases. Thus, the data presented by this investigation should not be considered a reality for occasions after this date. Many things have evolved and been adapted, therefore, the authors of this study encourage new research to be within their scope.

3.6 Future contributions of ERE to Brazilian education

As adaptations and modifications carried out during the ERE, we make sure that not only the teachers, but also the students, gain more experience with digital technologies (TDIC's) and take ownership of the use of tools and software not previously used. The real importance of Internet access for all and computers for all educational institutions (Universities, institutes and schools) is highlighted. These learners will be able to contribute to the future to optimize time and enable greater diversification in the practices used in classrooms and the types of evaluative activities.

If this hybrid is maintained, these tools can make it possible for students to access extra content, directly from their residences, which can contribute to better education and learning (Bacich et al., 2015). It can also be reflected that activities such as hybrid education can contribute to the greater achievement of students in non-basic education, for example in Youth and Adult Education (EJA), where people spend most of the day working (Silva et al., 2021).

4. **Final considerations**

This study allowed us to identify a large section of teachers who will face difficulties in the transition to emergency remote teaching, 74% of this research, being them related mainly to the migration process to the virtual environment, use of new technologies and psychological difficulties. These challenges can negatively impact both the performance of teachers and the learning of students.

Familiarity with TDIC's is essential to achieve the pedagogical objective not online, and therefore, mapping and identifying the technical challenges is of great importance. Work like this is relevant because we share significant results that reinforce the need for researchers, administrators and educators to understand and

validate the processes implemented during the transition to the ERE. Thus, this research emphasizes the importance of incorporating TDIC's into the regular educational agenda, as it can contribute so that if another emergency event arises, teachers and students should be more prepared.

Faced with the shortcomings of this study, the authors recommend that IES offer resources for the support and resolution of teaching difficulties, as well as events that promote the promotion of mental health of teachers. Furthermore, it is emphasized that any transition requires planning and financial investment in adequate training for teachers, so that education in a virtual context reaches the same performance observed in learning moments in in-person encounters.

5. Acknowledgments

The authors thank the Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES, Financial Code 001) and the Virtual University of the State of São Paulo (UNIVESP).

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